

REMARKS

Claim 1 has been amended in an earnest effort to address the language objections raised by the Examiner. More particularly, reference to the term “template” has been cancelled from claim 1.

Turning to the 112 rejections, and considering first the rejection under 35 USC 112, first paragraph, the Examiner seems to be suggesting that identifying “one structure in the database which fits the query protein sequence” is inconsistent with “fitting of the query sequence to plurality of structures (set of structures) from the database”. Of course, these are the same thing – i.e. Applicants compare one query sequence against all of the structures in the database; the structure in the database that has the best score, is the best fit with the query sequence.

Applicants believe that the specification is quite consistent the description of this. If the Examiner considers that any specific portion of the disclosure is confusing, Applicants would be happy to discuss this issue with the Examiner in a telephone interview.

Turning to the rejection under 35 USC 112, first paragraph, the Examiner has alleged that all of the pending claims are indefinite.

The primary focus of this objection appears to be on the “template” wording. As noted above, the single instance of the word “template” was included in error, and has been removed from claim 1. Applicants therefore assume that this results the majority of the Examiner’s concerns under this heading.

Under item B, the Examiner also alleges that the description does not disclose that performing the claimed steps results in identifying a “best fit”. Applicants do not agree.

Claim 1 requires, in part, “the structure that optimally aligns with the query protein sequence being identified as the best fit” (emphasis added). A person skilled in the art of

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protein threading would have no difficulty understanding that “optimal alignment” with regard to protein threading, is synonymous with finding the “best fit”. The term “optimal alignment” is used numerous times in the description, in various forms (approximately hits).

As the Examiner no doubt is aware, the claims are to be interpreted from the perspective of the person skilled in the art. The entire application is directed to protein threading and aligning, and in fact, these specific words appear in all of the pending claims. The person skilled in the art would have no difficulty understand that the entire point of threading and aligning is to find “best fits”.

Applicants also note that the “best fit” wording was added in a previous claim amendment in an attempt to simply and clarify the claims. In fact, Applicants never felt that this wording was necessary in view of the “threading”, “alignment” and “optimally align” wording already appearing in the claims.

Under item D, the Examiner also alleges that the description fails to teach that the structure with the “minimum energy score” is the final output, as per claim 15. Applicants do not agree.

Applicants have used the convention that is used in the art, which is consistent with the prior references identified in the description.

The energy score equations and constraints in paragraphs [0059] – [0066] are also clearly set out in such a manner that the best fit will result in the lowest score. Substituting exemplary numbers for poor matches into these equations immediately shows that the energy scores for poor matches will be higher than those for good matches.

Applicants submit that this convention would be immediately clear to the person skilled in the art of protein threading. If the Examiner would like this to appear more explicitly in the

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description, Applicants would be happy to discuss, in a telephone conference, the best manner in which this could be accomplished.

Turning to the rejection of claims under 35 USC 101, the Examiner has rejected claims 1 – 11 and 13 as being directed to non-statutory subject matter, the specific allegation being that these claims do not “recite tangible output (e.g. displaying, etc.) or a subsequent transformation.”

Applicants note that no such objection was raised against claim 15, which recites the “output” of the structure that optimally aligns with the query protein. Assuming that this “output” satisfies the Examiner’s requirements, claim 1 has been amended in a similar manner. Thus, amended claim 1 reads that the optimally aligning structure is “identified” and “output”, both of which are tangible and valuable results.

Applicants therefore ask that the rejection under 35 USC 101 be withdrawn.

Turning to the art rejections, and considering first the rejection of claims 1, 2 and 15 as anticipated by Meller et al., on pages 243 and 244 Meller et al describe how to use LP (linear programming) to obtain energy parameters, as the subtitle “Linear Programming Protocol for Optimization of the Energy Parameters” indicates. In order to train these parameters, they assume some threading results -- but the threading itself used in formula (7) on page 243 was not obtained by LP.

In contrast, Applicants are claiming the solution of the threading problem by LP, as per claim 1. For example, claim 1 reads, in part: “establishing linear programming (LP) constraints for threading”, and “performing a linear programming analysis … to optimally align …” It is quite clear that Meller et al do not do this.

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The claimed invention focuses on a totally different problem than Meller et al. Meller et al computes the parameters for an energy function using LP. In order to do training, they have assumed some threading (values for which are given, not determined by LP). Meller et al does not do threading, much less "establishing linear programming (LP) constraints for threading", and "performing a linear programming analysis ... to optimally align ..." as Applicants have claimed.

Thus, the rejection of claims 1, 2, and 15 as anticipated by Miller et al. is in error, and reconsideration thereof is respectfully requested.

Turning to the rejection of claims 3-7, 11 and 13 as obvious from Meller et al. in view of Akutsu et al., claims 3-7, 11 and 13 are directly or indirectly dependent on claim 1. The deficiencies of Meller et al. vis-à-vis claim 1 are discussed above. Akutsu et al. does not supply the missing teachings to Meller et al. to achieve or render obvious claim 1. Accordingly, no combination of Meller et al. and Akutsu et al. reasonably could be said to achieve or render obvious claim 1 or claims 3-7, 11 and 13 which depend directly or indirectly thereon.

Having dealt with all the objections raised by the Examiner, the Application is believed to be in order for allowance. Early and favorable action are respectfully requested.

In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account Number 08-1391.

Respectfully submitted,


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Amendment E

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: MAIL STOP AMENDMENT Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on April 22, 2008, at Tucson, Arizona.

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